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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/569,470	10/20/2006	Yutaka Nishioka	026390-00034	8564

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EXAMINER	
LOUIE, MANDY C	
ART UNIT	PAPER NUMBER
1715	

NOTIFICATION DATE	DELIVERY MODE
09/01/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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IPMatters@arentfox.com
Patent_Mail@arentfox.com

Office Action Summary	Application No.	Applicant(s)	
	10/569,470	NISHIOKA ET AL.	
	Examiner	Art Unit	
	MANDY C. LOUIE	1715	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 July 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3 and 6-16* is/are pending in the application.

4a) Of the above claim(s) *2,3 and 11-15* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 6-10, 16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *7/30/10, 3/24/10*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application.
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 10 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 10 requires that the oxide thin film is made from several oxides that will be in the final films themselves (see paragraph 0014). In claim 1, the parent claim to claim 10, the raw materials are vaporized into a raw gas, and in combination with an oxidizing and carrier gas, are used to make the oxide films. The nature of the invention is such that there are other raw materials, such as PZT film precursors in the Examples and paragraph 0035, for example, of the instant specification, and not the oxides as claimed, that are actually used to make the oxide films. The state of the prior art would support that it is common to vaporize a liquid or solid precursor and add an oxidizing group to receive an oxide film. To make an oxide film from an oxide would have an unreasonably high sublimation point, and would most likely undergo sintering if heated to melt the oxide, destroying its chemical structure. Further, if one was to use an oxide to make an oxide film, the use of an additional oxidizing agent is questionable. The

level of one of ordinary skill, such as a bachelor's or master's level with appropriate surface coating background, would not be able to repeat the experiment by sublimating an oxide to make an oxide film again because of sintering and a high sublimation temperature. Using an oxide to make an oxide film would not be predictable in the art, but using other raw materials would be. The amount of direction provided by the inventor is shown by the working examples in which the oxide films are not formed from oxides but other precursor compounds used to achieve the final film as an oxide. There would be an unreasonable amount of experimentation associated with trying to sublimate an oxide in order to make an oxide film, for the reasons above. Therefore, using an oxide to form an oxide film is not enabled.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1, 6-10, 16 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The Applicant cites support for the instant amendments in [0023] of the applicant's specification; however, the provided support is insufficient to disclose the

limitation "decomposing the gas mixture into metal atom-containing molecules in the gas activating means," and only discloses the gas activating mean is maintained at a temperature without causing any liquefaction, deposition, or film-formation of the raw gas therein, and that metal atom-containing molecules within the gas mixture can be introduced into the reaction chamber. It appears that no support can be found for decomposing the gas mixture into metal atom-containing molecules *within* the gas activating means. Therefore, it appears that the inventors, at the time the application was filed, did not reasonably have possession of the above claimed invention.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim(s) 1, 6-8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikeda [US 5462899].

Regarding claim 1, Ikeda teaches a method for preparing a silicon oxide film deposited onto a substrate [abstract], which comprises the steps of mixing a raw gas obtained through the vaporization of a raw material comprising metal atoms for the

oxide thin film such as TEOS [col 3, ln 50-52] (wherein silicon will be considered as metal upon interpretation of the resulting metal oxide film may be silicon oxide in claim 10, paragraphs 10-14 of the specification and the above 112, first paragraph rejection), and a carrier gas such as nitrogen [col 3, ln 55], and an oxidation gas such has oxygen gas or ozone [col 4, ln 1] in a gas-mixing unit [col 4, ln 5-6], passing the gas mixture through a gas activating means (i.e. heated feed line to chamber) [col 4, ln 10-11], maintaining the gas activating means at a temperature that allows for intermediate reaction products between TEOS and the oxidant [col 4, ln 7-10], wherein it would have been obvious to one of ordinary skill in the art that the presence of the heat and oxidant would cause at least some breakdown of the gas mixture into metal atom containing molecules to generate intermediate reaction products (vapor phase decomposition), And supplying the gas mixture on a heated substrate placed in a reaction chamber asa chemical vapor phase growth apparatus [col 4, ln 20; col 3, ln 45-50] through the shower plate (dispersion plate) [col 3, ln 40-45] to thus make the gas mixture react with one another [abstract], wherein a rate of oxidation gas flow rate (i.e. second oxidant of 10 slm) is not less than 60% basis of the gas mixture (i.e. 1 slm of TEOS carried with nitrogen and 2 slm of first oxidant) [col 4, ln 20-26]. Although the prior art teaches forming the intermediate product (decomposing) within the heated mixer, and does not explicitly teach decomposing the gas mixture within the heated feed line, it would have been obvious to one of ordinary skill in the art to continue decomposing (forming the intermediate product) until the gas mixture is supplied to the substrate, which would include the heated feed line.

Regarding claim 6, the prior art teaches the taught method avoids the disadvantageous inherent to the conventional premix method [col 2, ln 12-13] such as forming repeated solid oxides and accumulations in the piping [col 1, ln 49-52] and to form a film with low moisture content [col 2, ln 56]; therefore, it would have been apparent that the heating would have been maintained at a temperature avoiding disadvantageous such as film formation liquefaction.

Regarding claim 7, the prior art teaches the oxidation gas may be ozone [col 2, ln 27].

Regarding claim 8, the prior art teaches the carrier gas may be nitrogen [col 3, ln 55].

Regarding claim 10, the prior art teaches the silicon oxide film may be silicon dioxide [abstract].

Regarding claim 16, the prior art teaches the gas activating means comprises a heated pipe line (feed line) [col 4, ln 10]; wherein it would have been obvious to one of ordianry skill in the art to provide a heating means to heat the pipe line.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ikeda in view of Hayashi [US 20010012698].

Teaching of Ikeda is aforementioned, but appears to be silent in teaching the substrate is made from one of the claimed materials in claim 9. Hayashi remedies this.

Regarding claim 9, Lee teaches integrated circuits (semiconductor devices) with a silicon oxide layer may be formed on substrate such as wafers made of silicon or

insulators such MgO [0050]. It would have been obvious to one of ordinary skill in the art that MgO substrate would be an operable equivalent substrate to a silicon wafer for forming a semiconductor device comprising a silicon oxide layer.

Response to Arguments

Objection to Information Disclosure Statement is withdrawn due to applicant's submission of foreign reference copies.

Objection to specification for lacking section titles is withdrawn due to applicant's amendments of the specification.

Rejection under 35 USC 101 is withdrawn upon further consideration.

Rejection under 112, second paragraph of claims 5-6 is withdrawn due to cancelation of claim 5.

Applicant's arguments filed 7/30/10 have been fully considered but they are not persuasive. Rejection of claim 10 under 35 USC 112, first paragraph is maintained, as explained in the above rejection.

Applicant's arguments with respect to claims 1, 6-10 and 16 over Kher have been considered but are moot in view of the new ground(s) of rejection necessitated by amendments (i.e. decomposing the gas mixture into metal atom-containing molecules in the gas activating means).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MANDY C. LOUIE whose telephone number is (571)270-5353. The examiner can normally be reached on Monday to Friday, 8:30AM - 5:30PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571)272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. C. L./
Examiner, Art Unit 1715

/Timothy H Meeks/
Supervisory Patent Examiner, Art Unit 1715